Final Report:
Iowa Medicaid Enterprise Provider Practice and Clinic Health Information Technology Survey

November 2021

Submitted to:
Carrie Ortega, HIT Coordinator
Iowa Medicaid Enterprise
Department of Human Services
cortega@dhs.state.ia.us

Prepared by:
Kathy Schneider, PhD
Miriam Isola, DrPH, CPHIMS
Brian E. O'Donnell, PhD
David Troiano, RPh, CPPS

Sum-IT Health Analytics, LLC
http://www.sumithealthanalytics.com/
Using strategic analytics to transform your mountain of data into powerful, actionable insights

Executive Summary

Since 2011, Iowa Medicaid Enterprise (IME) has been administering the Iowa Medicaid Promoting Interoperability Program (formerly known as the Electronic Health Record (EHR) Incentive Program) which provides incentives to certain healthcare providers throughout Iowa.[1] Some key features of the program include:

- Administration of Medicaid incentive payments to Medicaid Eligible Professionals (EPs) and Eligible Hospitals (EHs),
- Oversight of the Promoting Interoperability Program, including routine tracking of meaningful use attestations and reporting mechanisms, and
- Pursuit of initiatives that encourage the adoption of certified EHR technology for the promotion of health care quality and the electronic exchange of health information.

The Centers for Medicare and Medicaid Services (CMS) requires state Medicaid agencies to perform periodic environmental scans as part of the program requirements. The current study is the final environmental scan conducted to close out the Health Information Technology for Economic and Clinical Health (HITECH) Medicaid Promoting Interoperability Program.

IME contracted with Sum-IT Health Analytics to conduct a survey to better understand the current Health Information Technology (HIT) capabilities and future plans of Iowa provider practice and clinic organizations as they relate to exchanging information with providers outside their organization and their capabilities of interoperability. The survey included questions about provider practice and clinic organizations' electronic health record implementation and use, as well as how they send, receive, find, and integrate information into their EHRs.

Methods

The study population consisted of the provider practices and clinics in Iowa for which one or more providers in their organization received funding through the Iowa Medicaid Promoting Interoperability Program at some time during the 10-year period from its inception in 2011 through 2021.

There were 92 points of contact (POC) from 87 organizations, who received an e-mail invitation to participate in the on-line survey. The survey contained 13 multiple-part questions about HIT. Survey responses were weighted to represent the corresponding number of practices, since a single POC could have responded on behalf of more than one practice. 'Practice' is the primary unit of reporting for the study.

Results

From the 92 POCs, 78 responses were received, resulting in an 85% response rate. Respondents provided information for 873 practices with approximately 8,153 providers.

---

[1] https://www.ecfr.gov/cgi-bin/text-idx?node=pt42.5.495&rgn=div5#sp42.5.495.d

EHR Adoption, SDOH Referrals and Data Integration

- Ninety-eight percent of practices use 2015 certified EHRs, which include the latest Office of the National Coordinator for Health Information Technology (ONC) required specifications.
- Although 85% of practices capture or record information related to patient's needs for community-based services or social determinants of health (SDOH), only 67% integrate the information into the EHR as structured data.
- Sixty-one percent of practices use both electronic methods and paper, fax or phone to send SDOH referrals, while only 4% use only electronic methods.

Interoperability

ONC defines interoperability as the architecture or standards that make it possible for diverse EHR systems to work compatibly in a true electronic information exchange. ONC developed a measure that comprises the four domains of interoperability: send, receive, find (or query), and integrate (or incorporate) health information into an EHR without manual effort. The survey contained questions on these four areas to assess provider practices' interoperability capabilities.

1. Send and Receive

Respondents provided information regarding how their organization sends and receives patient health information with providers outside of their organization. The methods and percentage of practices using the method to send and receive are displayed in Exhibit A below.

- Direct Secure Messaging is used by most practices.
- EHR vendor-based HIE tools are used to send and receive more often than HINs/HIOs.

Exhibit A. Methods used to send and receive information outside the organization.
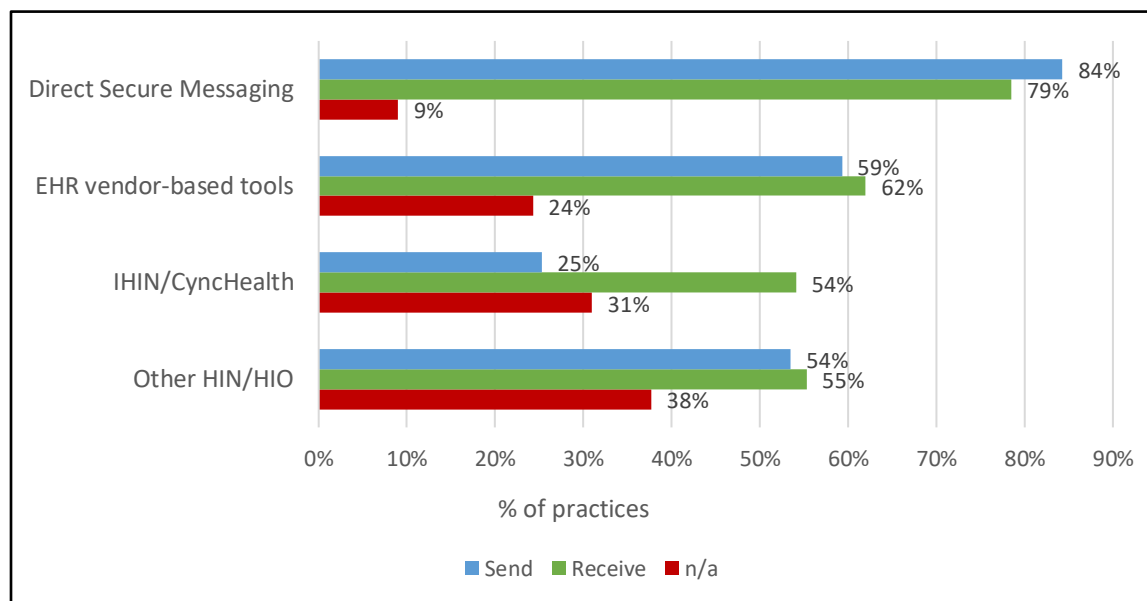
2. Find

Organizations most commonly report their practice queries or finds a patient's health information from sources outside of their organization via their EHR vendor-based HIE tools. Reference Exhibit B.

- More practices use EHR vendor-based HIE tools to query for patient information than use IHIN/CyncHealth or other HIE/HIOs.
- 22% of practices were not able to query using any of the interoperable methods mentioned in the survey.

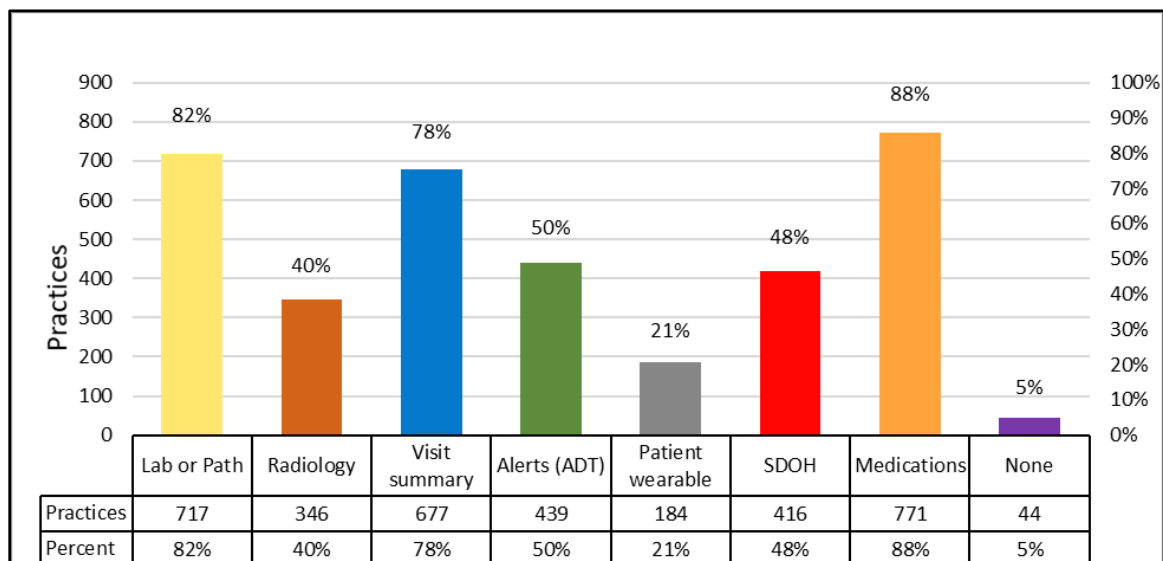Exhibit B. Query for information outside the organization.

Query	# Practices	%
EHR vendor-based HIE tools	605	69%
Access to other org EHR	273	31%
IHIN/CyncHealth	174	20%
Other HIN/HIO	22	3%
Third party portal	317	36%
VA/DOD system	64	7%
IDPH reporting	31	4%
N/A	191	22%

3. Integrate

Respondents reported being able to integrate various types of patient data they receive from outside organizations as structured data into their EHR. Integration of one or more of these types of data is shown in Exhibit C below.

- 76% of practices can integrate lab or pathology, visit summary and medications.
- Only 40% of practices can integrate information from radiology reports or images.

Exhibit C. Types of information integrated from outside organizations.


	Lab or Path	Radiology	Visit summary	Alerts (ADT)	Patient wearable	SDOH	Medications	None
Practices	717	346	677	439	184	416	771	44
Percent	82%	40%	78%	50%	21%	48%	88%	5%

![SUM-IT Health Analytics logo]

4. Interoperability Summary

Practice capabilities to electronically send, receive, query, and integrate information from outside their organization are summarized in Exhibit D below.

- A total of 60% of practices achieved interoperability in all four areas.
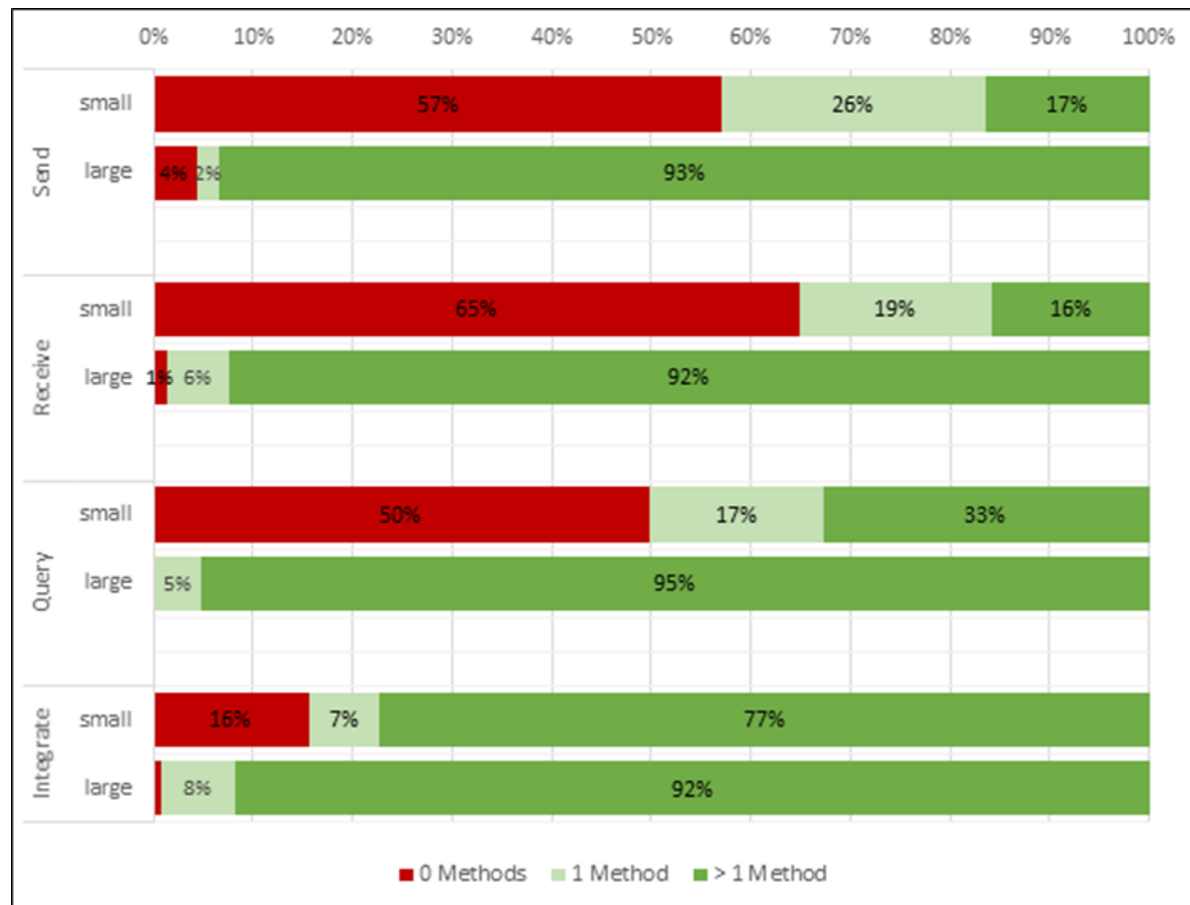
Exhibit D. Interoperability Summary.
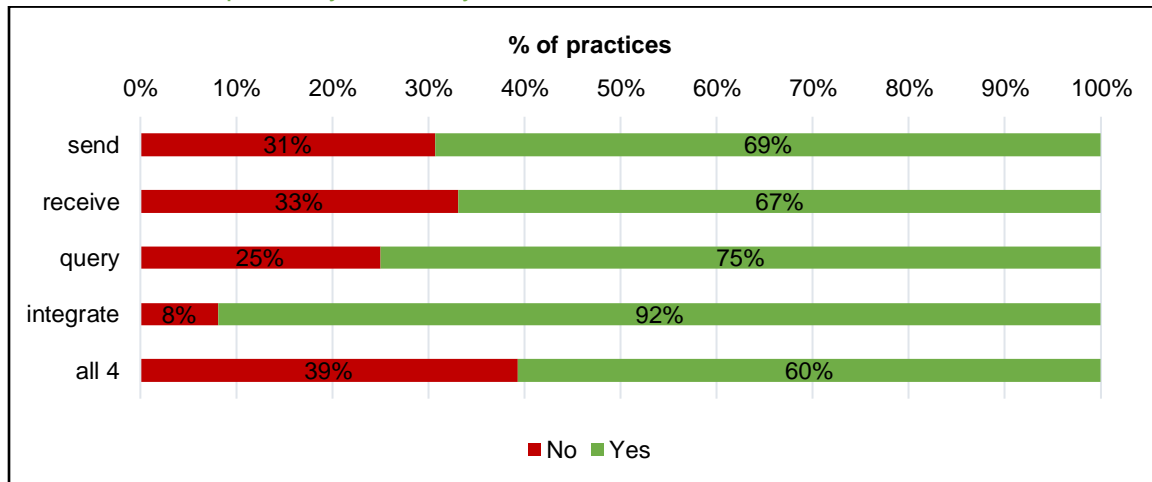
Practice capabilities vary by practice by size (Exhibit E).

Exhibit E. Practice capabilities vary by size.

- The larger practices (those with an average of >=10 providers per practice) reported being able to send (95%), receive (98%), and/or query (98%), using one or more interoperable method, and to integrate at least one type of data into the EHR (99%).
- By comparison, the smaller practices (those with an average of <10 providers per practice) reported being able to send (43%), receive (35%), and/or query (50%), using one or more interoperable method, and to integrate at least one type of data into the EHR (84%).

For the final analysis, the proportion of providers who can interoperably send, receive, query, and integrate is examined by practice size. The count of how many of these interoperable measures were achieved is depicted (Exhibit F).

Exhibit F. Count of interoperable measures.
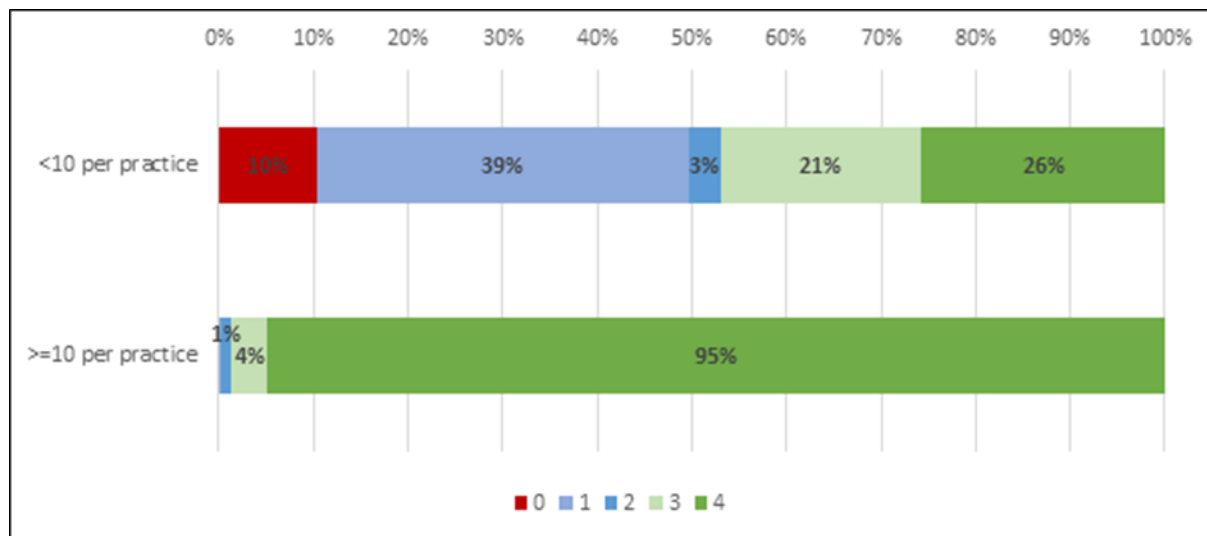
- 95% of larger practices reported being able to do all four: send, receive, query, and integrate at least one type of data into the EHR.
- For smaller practices, only 26% do all four, 21% do three, and 10% had not achieved any of the interoperability measures.

After reviewing the final survey report again, we found this to be a really BIG 'aha' finding in the report, and is very noteworthy to show that even with the incentives, smaller practices are having a harder time with interoperability at this point.

Use of EHR Information to Impact Patient Care

Beyond the interoperability questions, the survey examined how practices are using the information from their EHR to impact patient care. The majority of respondents reported their organization uses information from their EHR to perform more than one of the activities depicted in Exhibit G below.

- 85% of practices reported they perform data analytics with their EHR data.
- 83% use EHR for population health management.

Exhibit G. Use EHR to impact care.
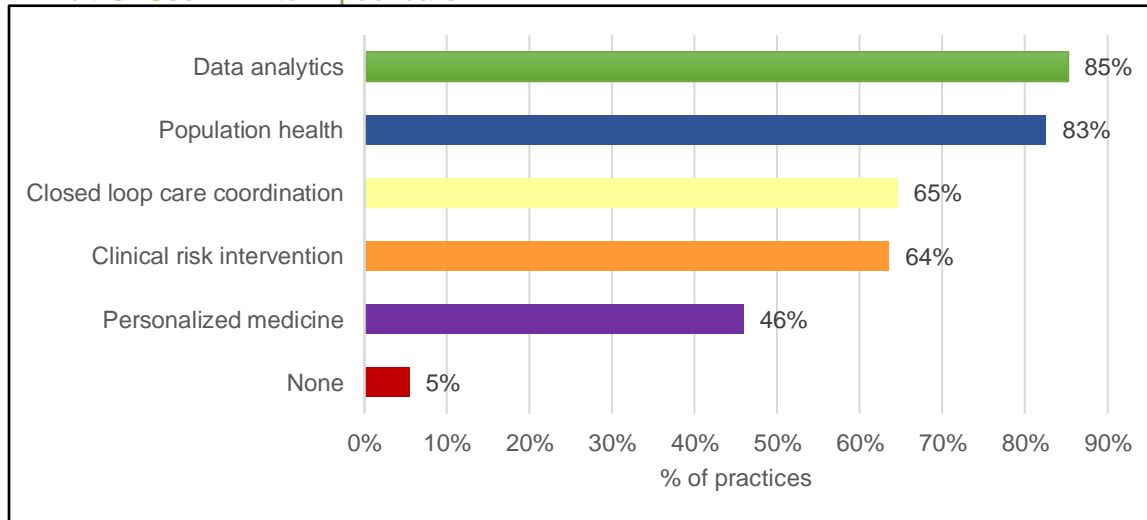
Future Priorities for HIT Implementation and Information Sharing

Respondents were asked about their organization's future priorities for HIT implementation, including if the implementation had already been completed. The types of technology that were most frequently reported as already completed were patient portals (82%), telehealth (75%) and patient APIs (73%). The four highest future implementation priorities for information sharing were to increase: 1) use of Direct Secure Messaging, 2) APIs for reporting quality or performance data, 3) telehealth, and 4) integration of information in the EHR related to SDOH.
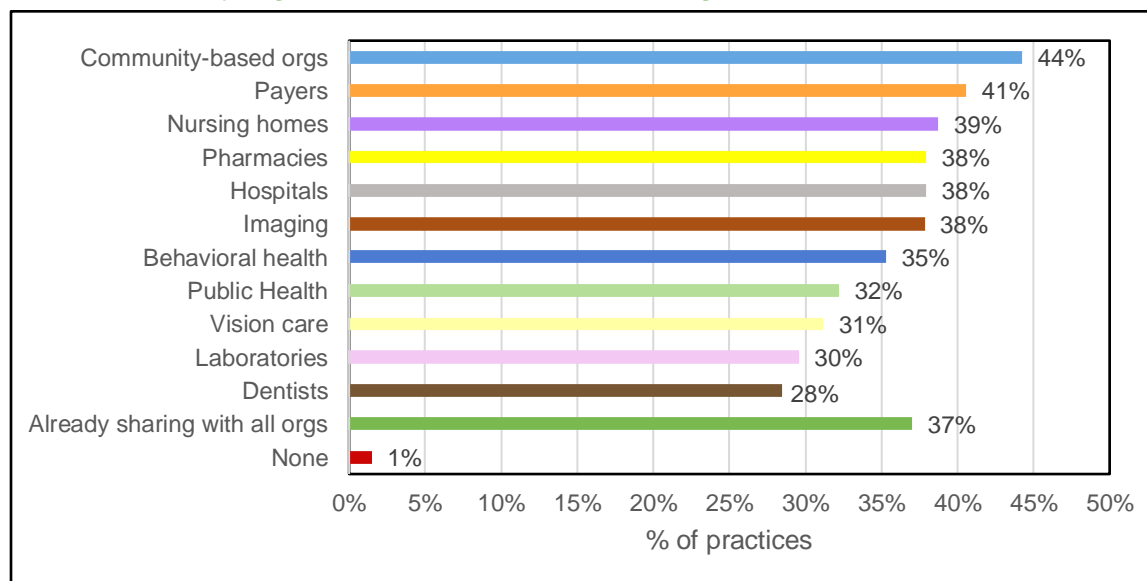
Respondents were asked about the organization's future priorities for interoperable health information sharing with various types of organizations, in particular, who they would like to begin sending or receiving patient data with (Exhibit F).

- A total of 37% of practices reported they already send and receive data interoperably with all types of organizations listed in the response categories.

Exhibit H. Priority organizations for future data sharing.

Organization	% of practices
Community-based orgs	44%
Payers	41%
Nursing homes	39%
Pharmacies	38%
Hospitals	38%
Imaging	38%
Behavioral health	35%
Public Health	32%
Vision care	31%
Laboratories	30%
Dentists	28%
Already sharing with all orgs	37%
None	1%

Other Considerations

Respondents were invited to share anything else they considered important to their organization's ability to send and receive interoperable data, or analyze information to improve care. Twenty-nine responses were gathered via free-form text. The common themes identified included:

- Issues related to lack of standards and technical compatibility,
- Lack of IT expertise and funding,
- Many of the respondents were specialty or other practices who claimed less need or interest in data sharing and were not required to do so by the CMS regulations,
- Lack of a central registry for providers/practices to find addresses to transmit or request information via Direct Secure Messaging, and
- Security/privacy concerns related to HIV and mental health inhibited data sharing.

Summary

This 2021 survey revealed several key points.

- A total of 98% of practices use certified EHRs. This indicates that overall, EHR adoption and use for those eligible professionals participating in the Medicaid Promoting Interoperability Program throughout Iowa clinics and practices have been successful over the past ten years.
- It was common for practices to use more than one method to send or receive information from outside their practices.

- o The most commonly used method to send/receive information, direct secure messaging, is considered basic interoperability to exchange information that does not require that disparate EHR systems be able to interpret the exchanged data[2].
- More practices use EHR vendor-based HIE tools to send, receive, and query for patient information than use IHIN/CyncHealth or other HIE/HIOs.
- One-fourth of practices were not able to query using any of the interoperable methods mentioned in the survey.
- Most practices can integrate data from outside organizations, although the types of data vary by practice.
- Most practices have engaged in data analytics with their EHR data to improve quality and/or efficiency of care.

This study included only practices that received incentives from the Medicaid Promoting Interoperability Program, and although they have implemented certified EHRs, many of these practices report only limited health data sharing with outside organizations.

Several important themes emerged from this study that may have future policy implications:

- Practices able to send, receive, query, and integrate information still face barriers to exchanging health data with providers who are not operating on an interoperable EHR.
- For an HIE/HIO to be useful and financially worthwhile for investment, it must be interstate.

Finally, some practices stated they need access to interstate HIE. We quote excerpts from two poignant comments, "Before we invest in HIE, we have to be able to access information via interstate, not just intrastate." and "…need an HIE that can communicate with not only Iowa." In addition, practices may struggle to fund interoperability efforts; we quote, "Medicaid heavy payer mix means less money to employ data analysts or to employ other tools within the EHR as additional features cost more money…".

---

[2] https://ehrintelligence.com/features/how-health-data-standards-support-healthcare-interoperability

Table of Contents

List of Tables

List of Figures

Background

The American Recovery & Reinvestment Act of 2009 (ARRA, or Recovery Act), established the Health Information Technology for Economic Clinical Health Act (HITECH Act), which requires that CMS provide incentive payments under Medicare and Medicaid to "Meaningful Users" of electronic health records (EHRs).[3] HITECH also provided several funding sources, including various grant programs through the Office of the National Coordinator for HIT (ONC) for States to achieve improved health care outcomes through health information technology (HIT).[4]

In 2011, CMS established the Medicare and Medicaid EHR Incentive Programs (now known as the Promoting Interoperability Programs) to encourage eligible professionals (EPs), eligible hospitals (EHs), and Critical Access Hospitals to adopt, implement, upgrade, and demonstrate meaningful use of certified electronic health record technology (CEHRT).[5] CMS defined and set objectives for each of the three stages of meaningful use:

> Stage 1) data capture and sharing,
>
> Stage 2) advanced clinical processes, and
>
> Stage 3) improved outcomes. This final stage of meaningful use is largely focused on interoperability, data sharing, and patient access to medical data.

Since 2011, Iowa Medicaid Enterprise (IME) has been administering the Iowa Medicaid Promoting Interoperability Program which provides incentives to certain healthcare providers throughout Iowa.[6] Some key features of the program include:

• Administration of Medicaid incentive payments to Medicaid EPs and EHs;

• Oversight of the Medicaid EHR Incentive Program, including routine tracking of meaningful use attestations and reporting mechanisms; and

• Pursuit of initiatives that encourage the adoption of certified EHR technology for the promotion of health care quality and the electronic exchange of health information.

CMS requires state Medicaid agencies to perform periodic environmental scans as part of the program requirements. The current study is the final environmental scan conducted to close out the HITECH Medicaid Promoting Interoperability Program. IME contracted with Sum-IT Health Analytics to conduct a survey to better understand the current HIT capabilities and future plans of Iowa provider practice and clinic organizations as they relate to exchanging information with providers outside their organization and their capabilities of interoperability. The survey included questions about provider practice and clinic organizations' electronic health record implementation and use, as well as how they send, receive, find, and integrate information into their EHRs.

---

[3] https://www.cms.gov/Medicare/Compliance-and-Audits/Part-A-Cost-Report-Audit-and-Reimbursement/HITECH-Audits
[4] https://www.healthit.gov/topic/onc-hitech-programs
[5] https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms
[6] https://www.ecfr.gov/cgi-bin/text-idx?node=pt42.5.495&rgn=div5#sp42.5.495.d

Key Objectives

This assessment was conducted to determine interoperability capabilities, collection and use of information from other medical and community-based providers, and exchange of healthcare data.

Methods

1. Population

The study population consisted of the provider practices and clinics in Iowa for which one or more providers in their organization received at least one incentive through the Iowa Medicaid Promoting Interoperability Program. The IME maintains a database of all providers in the state who participated in the program at some time during the 10-year period of the program from its inception in 2011 through 2021. Each organization represents one or more provider practices or clinics. The Practice is the unit of measure for the study, since the HIT capabilities are presumably available to all providers within the practice site.

The study was designed to have a separate survey completed by each of the included organizations for each unique set of EHR/software/HIT capabilities within the organization. Dental practices were excluded from the sample. After grouping providers into the practices that received the funding, there were 87 provider organizations, five of which had different HIT capabilities at two or more of their practice sites. This resulted in a population of 92 points of contact for the study. IME identified an HIT contact person and email address for each organization which contained a practice (or group of similar practices in terms of HIT) and verified the correct person to receive the survey within each practice though a personalized telephone conversation and emails.

2. Survey Instrument

Sum-IT Health Analytics, in collaboration with the IME, developed a survey instrument with questions in five thematic categories:
   a. Respondent and Practice/Organization Information
   b. Provider EHR Capabilities and Certifications
   c. Interoperability of Health Information Technology
   d. Use of Patient Information to Impact Care
   e. Future Plans

The survey questions were developed via an iterative, collaborative effort with contributions made by Sum-IT and IME team members. The final Survey instrument contained 13 multiple-part questions about HIT. Practice demographics were collected separately via phone and email contacts. A paper (Microsoft Word®) prototype was developed by Sum-IT and then programmed into an online data collection tool (SurveyMonkey®). Sum-IT tested the tool and the resulting test data file before dissemination.

3. Survey Outreach and Publicity

A key feature of our study protocol that is largely responsible for the high response rate obtained was the personalized and frequent outreach to organizations in the study sample. The HIT Advisor for the IME Promoting Interoperability Program was familiar to these Iowa practices

prior to the onset of this study. Telephone calls and emails were used to identify the organization representative who would be most knowledgeable about the study topics.

The HIT Advisor used a standardized script for communications to introduce the survey, explain the objectives and types of questions, and to request a contact person for the study. The HIT Advisor asked, "Does your EHR have the same functionality across your clinics?" If the answer was 'No', then additional surveys were distributed for the organization to complete.

4. Data Collection

Practice Enumeration and Size

The HIT Advisor collected data from each organization that had received at least one provider incentive payment from the Promoting Interoperability Program. The data that were collected included:

a. Contact to send the survey to and their contact information (name and email address)
b. Practice Name(s) and National Provider Identifier (s; NPIs)
c. Practice(s) ownership
d. Number of practices/clinics in the organization
e. Number of providers
f. Different EHRs/functionalities

Survey Dissemination

The survey link was sent via email from SurveyMonkey to the point-of-contact (POC) at each provider organization. The email message contained a brief email letter from the Interim Iowa Medicaid Director containing a link to the online survey with a request to complete the survey within two weeks. After the two weeks elapsed, a reminder email was sent to non-responding POCs, with a second request to complete the survey. The survey took, on average, 9 minutes to complete.

Sum-IT communicated frequently with the HIT Advisor while the survey was in the field so additional outreach could be performed to encourage completion of the survey. There were a small number of emails that "bounced-back"; as this occurred, additional outreach was performed and either the designated POC located the survey link or a new POC was identified. The HIT Advisor contacted those who had not responded in the final week the survey was in the field with a final reminder to complete the survey.

5. Data Analysis

At the end of the data collection period, final survey data were downloaded from SurveyMonkey and processed using Microsoft Excel® software. Data analysis proceeded through several iterative cycles as data were cleaned, merged and re-coded in preparation for analysis.

Survey Weighting

Sum-IT obtained practice and provider size information from each POC. The average practice size was calculated as the number of providers divided by the number of practices (# providers / # practices). This information was used to weight the survey responses to the corresponding number of practices and providers. The practice is the primary unit of reporting for the study.

The processed analytic files were exported into Microsoft Excel to enable dynamic iterative analysis including the use of graphs, charts and pivot tables.

Analyses

Frequency tables were generated for all survey questions. Some of the questions allowed the responders to select multiple options from a list of possible responses. The analyses include the patterns of multiple responses, such as a count of responses selected (none selected, one, two, three or all). Since respondents were not forced to answer each question, the number of responses may vary slightly by question. Variable values of free text survey questions were recoded and classified into thematic categories for reporting consistency.

After examining frequencies, bivariate analyses were performed to identify whether responses varied by practice size. Finally, responses to several survey questions were combined to examine the key themes in the survey: EHR Adoption, Interoperability, and Social Determinants of Health.

Results

The survey findings are presented in thematic categories below.

1. Respondent and Practice/Organization Information

From the 92 requested responses, (reflecting the variations in capabilities within an organization that were contacted), 78 responses were submitted to SurveyMonkey, resulting in a response rate of 85%. These respondent organizations provided information representing 873 practices/clinics (referred to as ***practices*** throughout this report), with approximately 8,153 providers. The distribution of responses by practice size is depicted below (Table 1).

Table 1. Respondent practice size.

Respondents			
Average Practice Size	**Responses**	**Practices**	**Providers**
< 10 providers per practice	63	436	2,119
>=10 providers per practice	15	437	6,034
Total	**78**	**873**	**8,153**

In instances where an organization had more than one EHR or HIT system or other variations in the HIT capabilities, the same individual may have completed more than one survey.

The 14 POCs that did not respond to the survey represented 37 practices (6 were >= 10 providers per practice) and approximately 233 providers.

Hereafter, the responses are presented in terms of the number of practices who responded to the question with a given answer (N=873).

2. Practice EHR Capabilities and Certifications

Respondents were asked about the use of technology at their organization. The first question was whether the practice(s) used an EHR to capture clinical information about their patients. Of those saying "Yes" a question followed regarding whether the EHR was 2015 certified (Table 2).

Table 2. EHR use and certification.

EHR Use	# Practices	%
a. Yes	**862**	**99%**
2015 certified EHR (Yes)	857	98%
Not certified	2	0%
Unsure	3	0%
b. No	**11**	**1%**
Total	**873**	**100%**

- Ninety-eight percent of practices use 2015 certified EHRs.

Respondents were asked how their organization captures or records information they collect related to patient's needs for community-based services or social determinants of health (SDOH). To ascertain whether capabilities for capture of SDOH varied by the size of the practice, these responses are displayed by average practice size (Table 3).

Table 3. Capture and record information for community-based service needs by practice size.

Average # providers	< 10 per practice		>=10 per practice		Total	
Capture SDOH needs	**Practices**	**%**	**Practices**	**%**	**Practices**	**%**
We do not perform these assessments or collect this information	114	26%	15	3%	129	15%
We do not enter this information in the EHR (e.g., use paper forms)	42	10%	0	0%	42	5%
We capture it as unstructured data (e.g., free text or scanned documents)	114	26%	6	1%	120	14%
We integrate it as structured data (e.g., as fields in the EHR)	166	38%	416	95%	582	67%
Total	**436**	**100%**	**437**	**100%**	**873**	**100%**

- 85% of practices capture this information,
- 67% (n=582) integrate the information into the EHR as structured data,
  - The 582 practices:
    - Represent approximately 6,815 providers (84% of the 8,153 total) (data not shown).
    - Demonstrate capabilities that vary by practice size.
      - 166 practices (38%) with an average practice size of <10 providers integrate SDOH data in their EHR as structured data, and
      - 95% of practices with >=10 providers integrate SDOH data in their EHR as structured data.

The online survey automatically skipped respondents out of the next question if they did not collect data on SDOH assessments (129 practices). Respondents who performed SDOH assessments were asked how their organization sends patient referrals, intake assessments or

requests for services to community-based organizations outside of their practice. They were invited to check all responses that were applicable (Table 4).

Table 4. Send patient referrals to community-based organizations.

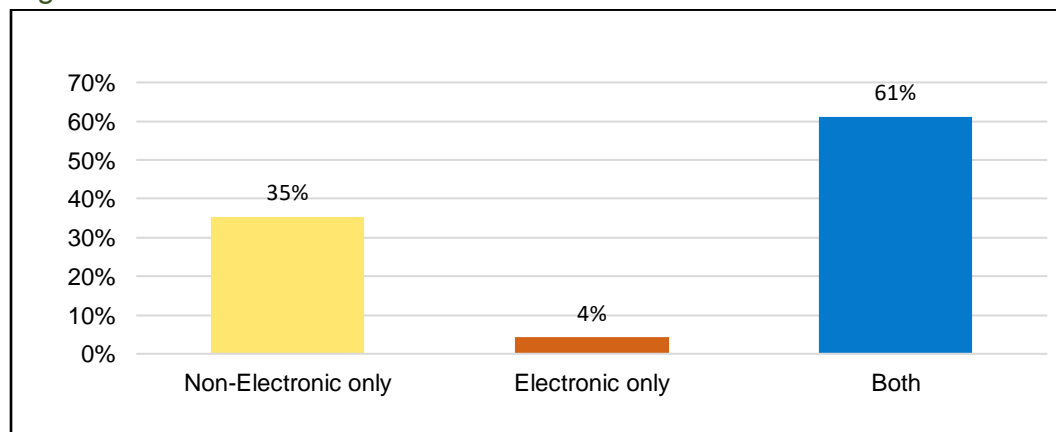| Send SDOH referrals	# Practices	%
Paper, fax or telephone	715	82%
Direct Secure Messaging	397	46%
EHR-based message	442	51%
Other	19	2%

The "Other" responses included:

- encrypted email (8 practices),
- electronic fax (7practices), and
- other organization's provider portal/ application programming interface (API;1 practice).

An additional 3 "Other" responses were either not related to use of technology to exchange information or were already specified in the responses.

It was common for practices to use a combination of methods to send patient referrals. We categorized the responses into either electronic or non-electronic methods for sending SDOH referrals. Results representing 744 practices are depicted below (Figure 1).

Figure 1. Combinations of methods to send SDOH referrals.

This measure is also examined by practice size (Table 5).

Table 5. Send SDOH referrals, by practice size.

Average # providers	< 10 per practice		>=10 per practice		Total	
Send SDOH referrals	Practices	%	Practices	%	Practices	%
Non-Electronic	221	69%	40	9%	261	35%
Electronic	27	8%	3	1%	30	4%
Both	74	23%	379	90%	453	61%
Total	322	100%	422	100%	744	100%

- Very few practices, regardless of size, send SDOH referrals electronically (only 4%).

- Only 23% of practices with <10 providers use both paper and electronic, while 90% of practices with >=10 providers use both non-electronic and electronic methods to send referrals.

3. Send, Receive, Query, and Integrate

ONC defines interoperability as the architecture or standards that make it possible for diverse EHR systems to work compatibly in a true electronic information exchange. ONC developed a measure that comprises the four domains of interoperability: send, receive, find (or query), and integrate (or incorporate) health information into an EHR without manual effort. The survey contained questions on these four areas to assess provider practices' interoperability capabilities.

First, respondents were asked how their organization electronically sends and receives patient health information with providers outside of their organization (Table 6). Selection of more than one method/option was possible.

Table 6. Send and receive information outside the organization.

Send and Receive	n/a (don't use this technology)		Send		Receive	
Exchange Method	# Practices	%	# Practices	%	# Practices	%
Direct Secure Messaging	79	9%	736	84%	685	79%
EHR vendor-based HIE tools (e.g., Epic Care Everywhere, CommonWell, etc.)	212	24%	518	59%	541	62%
Iowa Health Information Network (IHIN) – now doing business as CyncHealth Iowa	271	31%	221	25%	472	54%
Other health information network (HIN), health information organization (HIO), or health information exchange (HIE)	329	38%	467	54%	483	55%

The differences in the frequency with which respondents use different electronic options is visually depicted in Figure 2.

Figure 2. Methods used to send and receive information outside the organization.
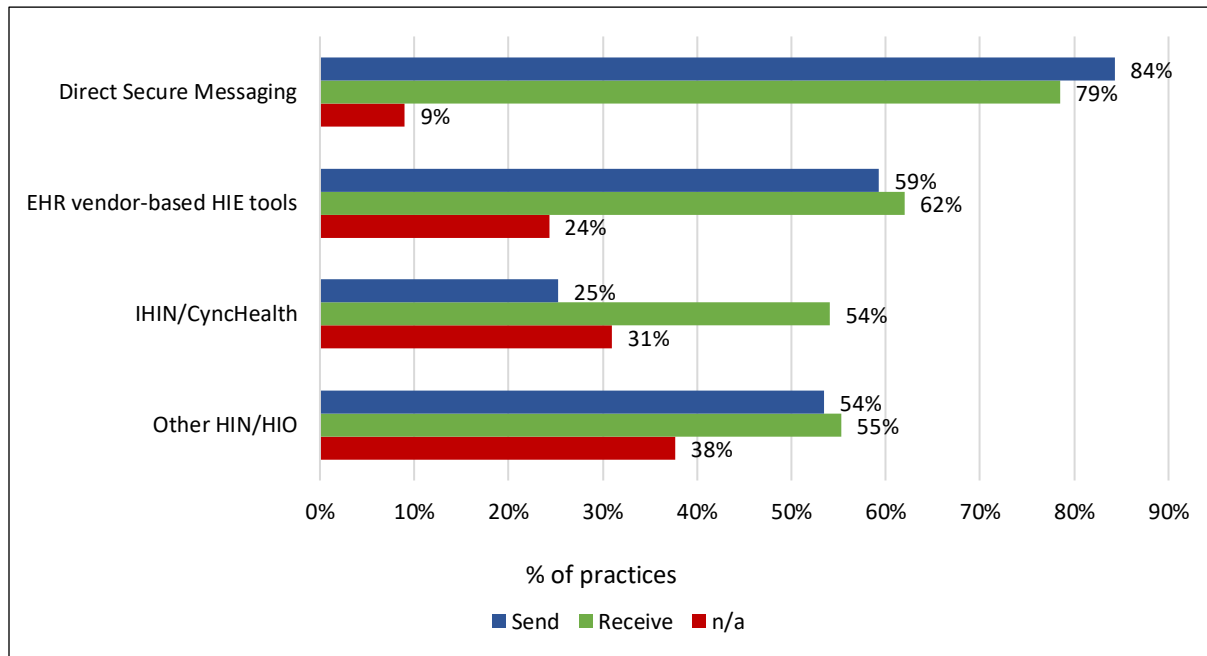
- Direct Secure Messaging was the most common tool practices use to electronically send (84% of practices) and receive (79% of practices) information.
- Practices frequently reported using EHR vendor-based health information exchange tools (59% of practices send and 62% receive).
- Other HIN/HIOs were more likely to be used than IHIN/CyncHealth to send information (54% compared to 25%, respectively), however both types of HIEs were commonly used to receive information by more than 50% of practices.
- Practices were twice as likely to receive than to send information through IHIN/CyncHealth.

Respondents representing 188 practices (22% of the total; n=873) responded that they do not use any of the three EHR-based response options; that is, although they do have a certified EHR, they selected n/a for EHR-vendor-based HIE tools, CyncHealth or any other HIN/HIO. Comparison to the earlier survey question regarding EHR use and certification revealed that most of these practices (93% of the 188) had 2015 Certified EHRs (Table 7). Two practices (1%) use EHRs that are not 2015 certified.

Table 7. EHR certification among practices not using the capability to send and receive.

EHR Certification for Practices Not Sending/Receiving	# Practices	%
a. Yes	**177**	**94%**
2015 certified EHR (Yes)	175	93%
Not certified	2	1%
b. No	**11**	**6%**
Total	**188**	**100%**

Next, respondents were asked how their practices electronically search, query, or find a patient's health information from sources outside of their organization (Table 8). More than one method/option was possible. In addition, the survey instrument allowed respondents to select "Other HIN/HIO/HIE", and to insert a text response to describe the query mechanism.
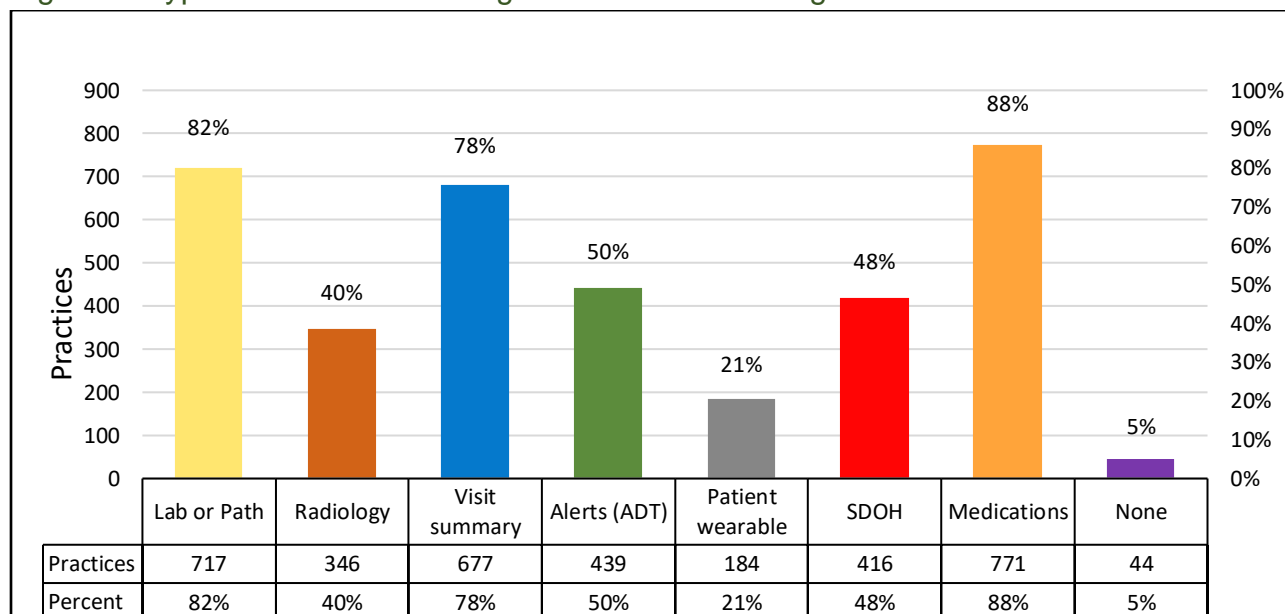
Table 8. Query for information outside the organization.

Query	# Practices	%
EHR vendor-based HIE tools	605	69%
Access to other org EHR	273	31%
IHIN/CyncHealth	174	20%
Other HIN/HIO	22	3%
Third party portal	317	36%
VA/DOD system	64	7%
IDPH reporting	31	4%
N/A	191	22%

- The other HIN/HIO responses (22 practices) included both other state (South Dakota Health Link) and national HIEs (Carequality and eHealth Exchange),
- The third-party portals mentioned included Direct Trust (300 practices) and PatientPing (17 practices),
- Reporting tools for Iowa Department of Public Health (IDPH) were mentioned in these responses, including the Immunization Registry (IRIS) and the Disease Surveillance System (IDSS), and
- SureScripts (for e-prescribing) was also mentioned as a way the organization queries for patient information.

Finally, respondents were asked whether the organization was able to integrate various types of patient data they receive from outside organizations as structured data into their EHR (Figure 3).

Figure 3. Types of information integrated from outside organizations.

	Lab or Path	Radiology	Visit summary	Alerts (ADT)	Patient wearable	SDOH	Medications	None
Practices	717	346	677	439	184	416	771	44
Percent	82%	40%	78%	50%	21%	48%	88%	5%

- Integration of one or more of these types of data is performed by 92% of practices,
- 5% reported integration of none of these data types,
- 3% did not check any of the types of data (i.e. skipped the question),
- Many practices can integrate lab or pathology, visit summary, and medications (629, or 76%), and
- Only 40% of practices can integrate information from radiology reports or picture archiving and communication system (PACS) images.

4. Use of Patient Information to Impact Care

Respondents were asked how organizations analyze and use patient information from the EHR (and possibly other sources) to improve quality and/or efficiency of care. Potential responses included[7]:
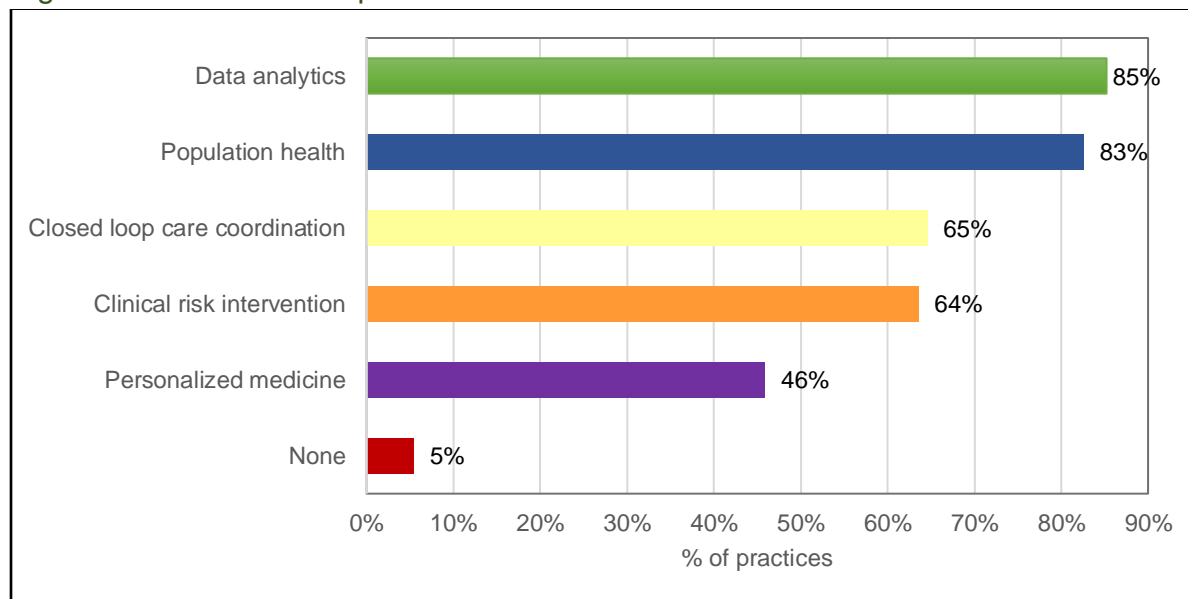
a. Population Health Management – Coordinated care across care settings using integrated personalized medicine.
b. Data Analytics – Track and report variations in care and operational efficiency, enhance quality of care, population health, and understanding the economics of care.
c. Clinical Risk Intervention & Predictive Analytics – Expands the focus on advanced data content and clinical support.
d. Personalized Medicine & Prescriptive Analytics – Leverages the use of advanced data sets, such as genomic and biometrics data to support uniquely tailored and specific healthcare treatments.
e. Closed Loop Care Coordination – The patient record tracks closed loop care delivery and multiple care pathways for each patient along with patient compliance tracking.

---

[7] Adapted from HIMSS Adoption Model for Analytics Maturity. https://www.himss.org/what-we-do-solutions/digital-health-transformation/maturity-models/adoption-model-analytics-maturity-amam

f. None of the above.

Respondents were asked to choose all categories that apply (Figure 4).

Figure 4. Use EHR to impact care.

- 85% of practices reported they perform data analytics with their EHR data,
- 83% use EHR for population health management,
- 65% use EHR data for closed loop care coordination,
- 46% of practices use information from their EHR to perform personalized medicine,
- 44% of practices do both – closed loop care coordination and personalized medicine (data not shown),
- Practice size has an impact on this capability:
    - Ninety-five percent of practices with 10 or more providers were able to do this, and
    - 34% of practices with less than 10 providers were able to do this (data not shown)

The majority of respondents reported their organization uses information from their EHR to perform more than one of these activities. The distribution is depicted in Figure 5.

Figure 5. Count of capabilities for using EHR information to impact care.
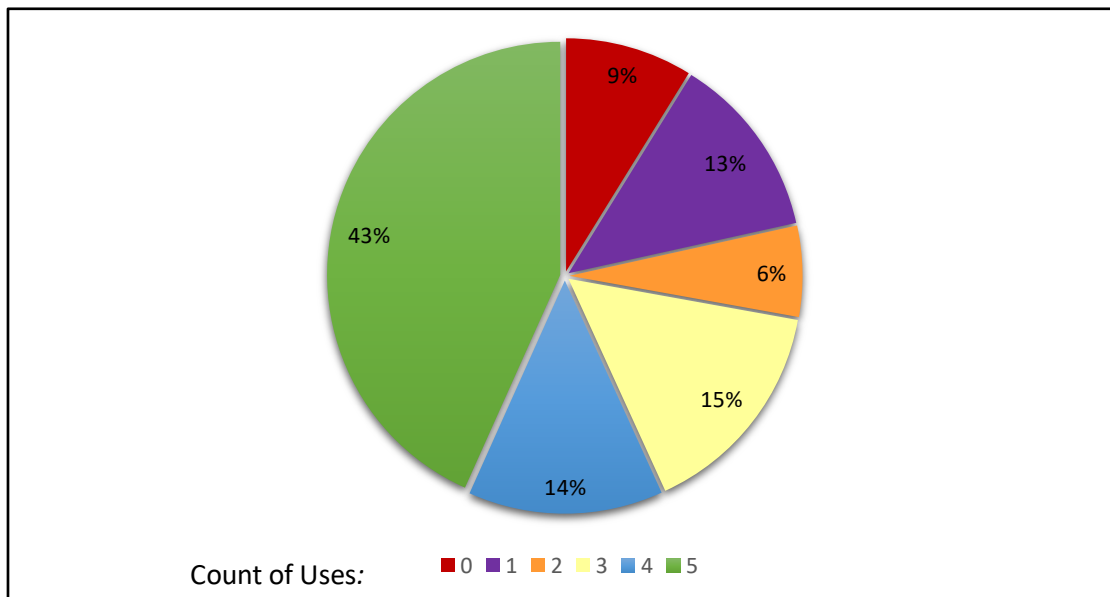
- 9% of practices did not have any of the capabilities listed in Figure 4, and
- 72% had three or more of the capabilities.

5. Future Priorities

In the last section of the Survey, respondents were asked about the organizations' future priorities for health information sharing – such as how they want to connect, share data, and with whom. They also had the opportunity to tell us something important about their organizations' HIT that was not already addressed in the survey.

Some practices have already completed their implementation of the types of technology listed in the survey. This proportion of practices having completed their implementation is depicted in the bar chart below (Figure 6).

Figure 6. Completion of HIT implementation for information sharing.
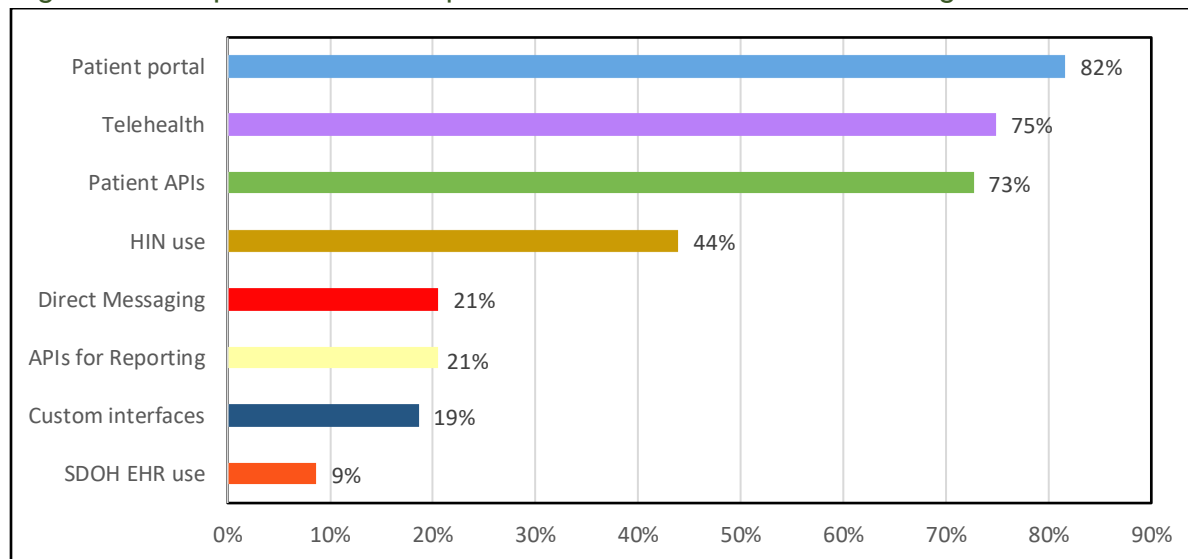
- The types of technology that were most frequently reported as already completed were:
  - patient portals (82%),
  - telehealth (75%), and
  - patient APIs (73%).
- This survey did not examine the depth of functionality included in the implemented technologies.

Within the same question, organizations that did not already complete implementation were asked to rate how much of a priority it was for their organization to implement, with a value of 1= not a priority and 4= high priority (Figure 7). Data were aggregated to create an average priority score for each item.

Figure 7. Priority for future HIT implementation for information sharing.
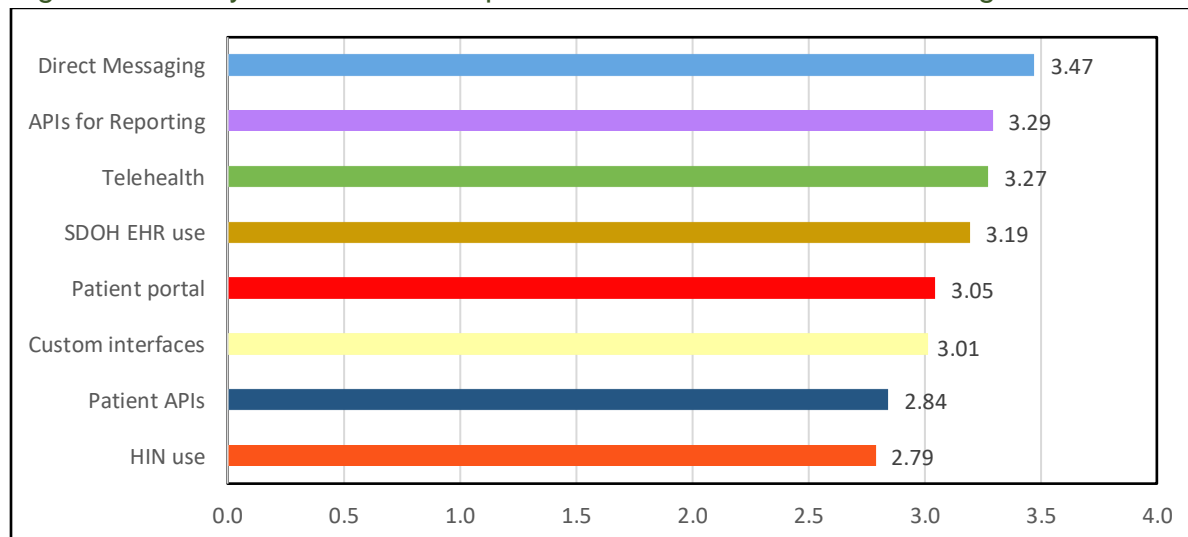
The three types of technology rated as the highest priority to implement in the future are:

- o Direct Messaging (average priority score is 3.47),
- o APIs for reporting quality or performance data (3.29), and
- o Telehealth (3.27).

Next, respondents were asked about the organizations' future priorities for interoperable health information sharing with the following types of organizations, in particular, who they would like to begin sending or receiving patient data with (Figure 8).

Figure 8. Priority organizations for future data sharing.
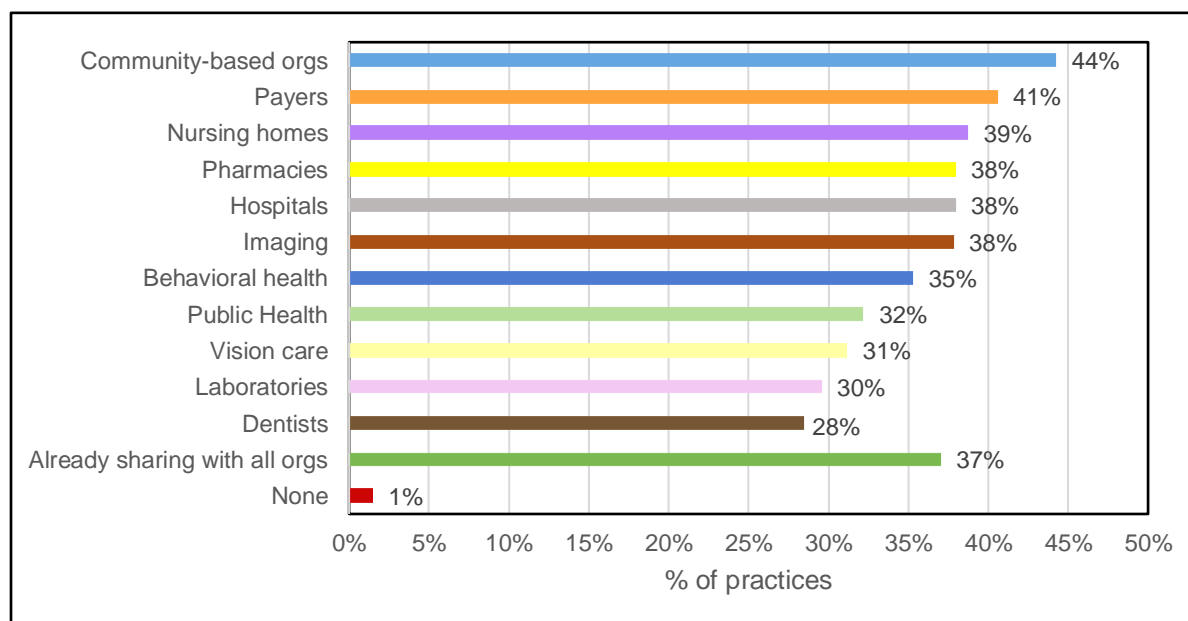
The types of entities most frequently identified as a priority for future data sharing were:

- community-based organizations (44% of practices),
- payers (41% of practices),
- 1% of practices reported that they are not interested in interoperable information sharing with any of these provider types, and
- 37% of practices (n=323) reported they already send and receive data interoperably with all types of entities listed in the response categories.
  - o Ninety-three percent of these (323) practices are large, with an average of 10 or more providers per practice (data not shown).

6. Other Considerations

For the final question of the survey, respondents were invited to share anything else they considered important to their organization's ability to send and receive interoperable data or analyze information to improve care. Twenty-nine responses were gathered via free-form text. The common themes identified, and the number of practices for which the response applied are depicted in Table 9.

Table 9. Open-ended response themes.

Open-ended response theme	# Practices
Issues related to lack of standards and technical compatibility	81
Lack of IT expertise and funding	34
Many of the respondents were specialty or other practices who claimed less need or interest in data sharing and were not required to do so by the CMS regulations	30
Lack of Direct Messaging capabilities for many practices	26
Lack of a central registry for providers/practices to find addresses to transmit or request information via Direct Secure Messaging	13
A few of the practices indicated that they had minimal capabilities with their current system and are moving to a different EHR system	12
Security/privacy concerns related to HIV and mental health inhibited data sharing	2
Need access to interstate, not just intrastate HIE – in order to be worth investment	2

Themes for other responses of interest, and illustrative quotes include:

- Financial issues with Medicaid patients — "Medicaid heavy payer mix means less money to employ data analysts or to employ other tools within the EHR as additional features cost more money…"
- Privacy concerns — "Confidentiality requirements slows down data transfer due to the need to receive patient approval to share data."
- Need interstate HIE — "Before we invest in HIE, we have to be able to access information via interstate, not just intrastate." and "…need an HIE that can communicate with not only Iowa."
- Technical issues with IHIN— "It has been extremely difficult getting our EHR system and IHIN on the same page."

7. Overall – Interoperability Capabilities

Information from several survey questions were used to summarize practice capabilities for interoperability and whether they were able to send, receive, query and integrate data from outside their organization.

a. Interoperably Send

A summary variable that counts the number of interoperable methods used by practices to send patient information was created; note this is a refinement of Table 6. The responses that were considered interoperable were: 1) EHR vendor-based HIE tools, 2) IHIN/CyncHealth, and 3) Other HIN/HIO. The results are depicted as none, one, or more than one of these interoperable methods - and displayed by practice size (Table 10).

Table 10. Count of methods for interoperable send, by practice size.

Average # providers	<10 per Practice		>=10 per Practice		Total	
Send Methods	Practices	%	Practices	%	Practices	%
None	249	57%	19	4%	268	31%
One	115	26%	10	2%	125	14%
>One	72	17%	408	93%	480	55%
Total	436	100%	437	100%	873	100%

- 69% of practices reported having the capability to send patient information,
- 55% reported using multiple methods to send, and
- 31%of practices were not able to send patient information using interoperable technology.
  - This capability varied by practice size with larger practices more likely to report having the capability to send patient information.

b. Interoperably Receive

A summary variable that counts the number of interoperable methods used by practices to receive patient information was created; note this is a refinement of Table 6. The responses that were considered interoperable were: 1) EHR vendor-based HIE tools, 2) IHIN/CyncHealth, and 3) Other HIN/HIO. The results are depicted as none, one, or more than one of these interoperable methods - and displayed by practice size (Table 11).

Table 11. Count of methods for interoperable receive, by practice size.

Average # providers	<10 per Practice		>=10 per Practice		Total	
Receive Methods	Practices	%	Practices	%	Practices	%
None	283	65%	6	1%	289	33%
One	84	19%	27	6%	111	13%
>One	69	16%	404	92%	473	54%
Total	436	100%	437	100%	873	100%

- 54% of all practices reported using more than one method to receive patient information,
- 33% of practices were not able to receive patient information using interoperable technology.
  - This capability varied by practice size with larger practices more likely to report having the capability to receive patient information.

c. Query

A summary variable that counts the number of methods used to query for patient information was created; note this is a refinement of Table 8. The responses that were considered interoperable were: 1) EHR vendor-based HIE tools, 2) Access to other organizations' EHR, 3) IHIN/CyncHealth, and 4) Other HIN/HIO. The results are depicted as none, one, or more than one of these query methods - and displayed by practice size (Table 12).

Table 12. Count of methods for interoperable query, by practice size.

Average # providers	<10 per Practice		>=10 per Practice		Total	
Query Methods	Practices	%	Practices	%	Practices	%
None	217	50%	1	0%	218	25%
One	76	17%	20	5%	96	11%
>One	143	33%	416	95%	559	64%
Total	436	100%	437	100%	873	100%

- 95% of all large practices (those with an average of >=10 providers) indicated that they used more than one of the methods listed in the survey to query data,
- 25% of practices overall, and half of the smaller practices (<10 providers) used none of the methods to query.

d. Integrate

A summary variable that counts how many of the 7 types of information the practice integrates as structured data was created; note this is a refinement of Figure 6. The categories included: 1) Lab/pathology results and reports, 2) Radiology reports/PACS images, 3) Visit summary, 4) Alerts such as admission, discharge or transfer (ADT) notifications, 5) Patient data from mobile devices or wearables, 6) Social determinants of health (SDOH), and 7) Medications. Results of this count variable are collapsed into three categories: none, one, or more than one of these types of data. The data are displayed by practice size (Table 13).

Table 13. Count of types of data integrated, by practice size.

Average # providers	<10 per Practice		>=10 per Practice		Total	
Integrate Types of Data	Practices	%	Practices	%	Practices	%
None	68	16%	3	1%	71	8%
One	31	7%	33	8%	64	7%
>One	337	77%	401	92%	738	85%
Total	436	100%	437	100%	873	100%

- 92% of practices were able to integrate one or more types of information into their EHR.
    - 77% of smaller practices (with <10 providers per practice) were able to integrate more than one type of data,
    - 92% of larger practices (with >=10 providers) were able to integrate more than one type of data,
- 8% of practices were not able to integrate any of these types of patient information.

Practice capabilities to electronically send, receive, query, and integrate information from outside their organization are summarized below. The proportion of practices that can perform the function using one or more than one method was calculated (Figure 9).

Figure 9. Interoperability summary.
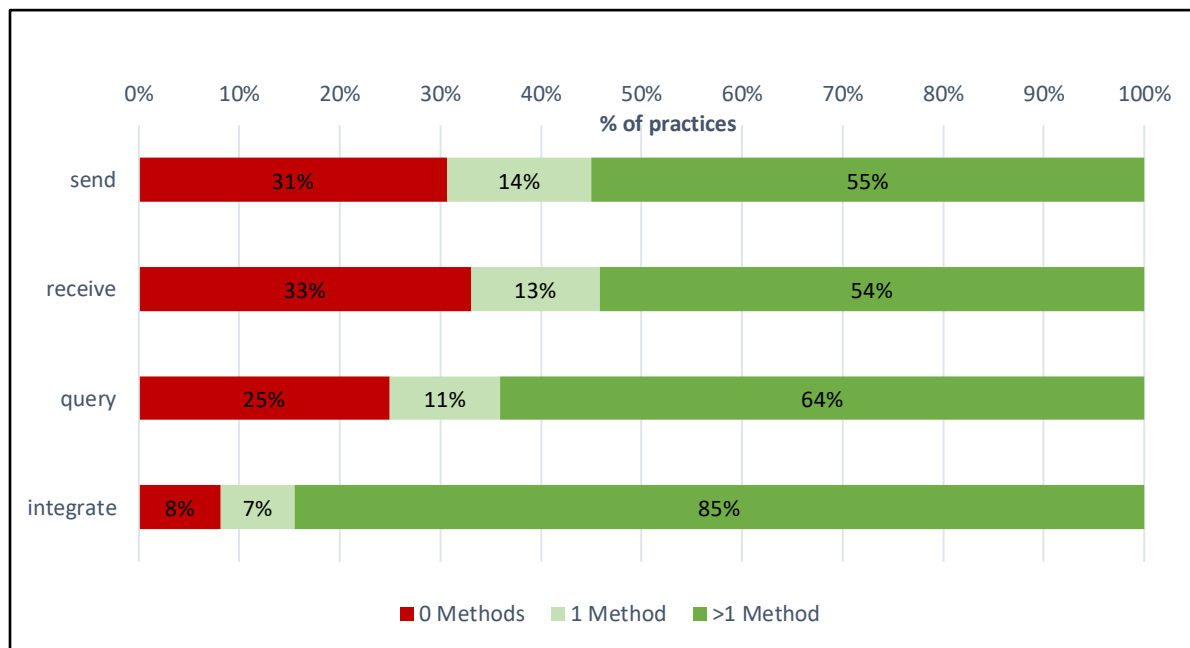
- 69% of practices send patient information,
- 67% receive patient information,
- 75% query for patient information using at least one interoperable method,
- Many practices send, receive, and/or query using more than one method,
- Nearly 92% of practices integrate at least one type of information into their EHR, and
- 85% integrate more than one type of information.

Practice capabilities vary by practice by size (Figure 10).

Figure 10. Interoperability summary by practice size.

- The larger practices (those with an average of >=10 providers per practice) reported being able to send (95%), receive (98%), and/or query (98%), using one or more interoperable method, and to integrate at least one type of data into the EHR (99%).
- By comparison, the smaller practices (those with an average of <10 providers per practice) reported being able to send (43%), receive (35%), and/or query (50%), using one or more interoperable method, and to integrate at least one type of data into the EHR (84%).

For the final analysis, the proportion of providers who can interoperably send, receive, query, and integrate is examined by practice size. The count of how many of these interoperable measures were achieved is depicted (Figure 11).

Figure 11. Count of interoperability measures achieved, by practice size.
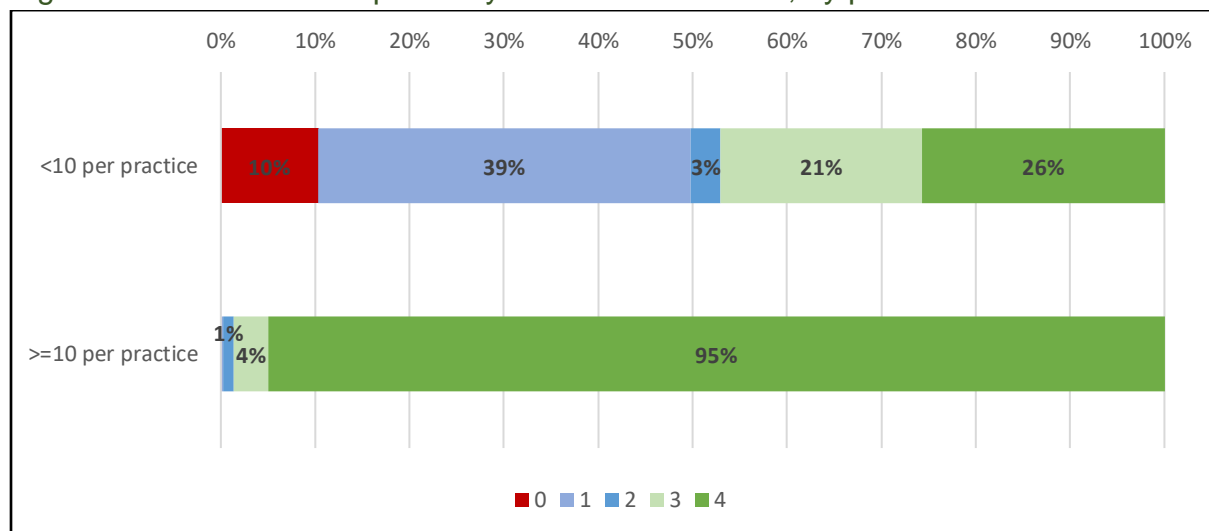
- 95% of larger practices reported being able to do all four: send, receive, query, and integrate at least one type of data into the EHR.
- For smaller practices, only 26% do all four, 21% do three, and 10% had not achieved any of the interoperability measures.

Summary

The survey response rate was 85%. This high rate was largely attributable to the personalized outreach prior to launching the survey, and follow-up reminders from the HIT Advisor while the survey was in the field. Ultimately, the respondents represented 873 practices with approximately 8,153 providers (Table 1).

A total of 98% of practices use 2015 certified EHRs. This indicates that overall, EHR adoption and use for those eligible professionals participating in the Medicaid Promoting Interoperability Program throughout Iowa clinics and practices has been successful over the past ten years.

Information regarding SDOH was recorded in the EHR for 81% of practices, and 67% of practices reported they integrate this information into the EHR as structured data (Table 3). This capability varied by practice size with 95% of larger practices (those with an average of 10 or more providers) reporting the ability to integrate SDOH in the EHR compared to 38% of smaller practices. To send patient referrals for SDOH, 61% of practices use a combination of electronic and paper, while only 4% were able to use electronic only methods – either Direct Secure Messaging or EHR-based message (Figure 1).

This survey explored interoperability capabilities to send, receive, query, and integrate information with organizations outside their practice. Differences in the types and number of different methods used were examined. In addition, differences in capabilities by practice size were examined. Direct Secure Messaging was the most commonly reported method to electronically send (84%) and receive (79%) patient information. EHR vendor-based HIE tools was the second most commonly used method to send information outside the practice - 59% of

respondents (Table 6), and 62% used EHR vendor-based HIE tools to receive this information. It was common for practices to use more than one method to send (55% of practices – reference Table 10) or receive (54% of practices – reference Table 11). Despite efforts to increase interoperability, 22% of respondents representing 188 practices reported that they do not engage in health information exchange using EHR vendor-based HIE tools or any HIE/HIN/HIO (Table 7), even though 93% had a 2015 certified EHR.

Although Direct Secure Messaging was the most frequently used electronic method for sending and receiving patient information (Table 6), it was also a high priority for future HIT implementation (Figure 7). Several respondents provided comments related to a desire to improve usability of Direct Secure Messaging – such as a central registry for providers/practices to obtain contact information so that patient data could be requested or sent, and the wish for more practices to use Direct Secure Messaging.

More than 600 practices (69%) use EHR vendor-based HIE tools to query for patient information (Table 8). Nearly 20% of practices use IHIN/CyncHealth, and 3% use some other HIE/HIO to query. One-fourth of practices were not able to query using any of the interoperable methods mentioned, and 64% are capable to query using two or more methods (Table 12).

The final component of interoperable information exchange studied involved a question regarding integration of data from outside organizations. The types of information most frequently integrated into the EHR from outside organizations as structured data were: 1) medications, 2) lab or pathology, and 3) visit summary (Figure 3). In fact, 76% of practices reported they integrated all three of these data types. Data were analyzed to examine how many of these data types were being integrated (none, one, more than one type). Eighty-five percent of practices reported integrating more than one type of information (Table 13). An additional 7% of practices indicated that they were integrating one type of information and 8% reported that they were not integrating any of these information types.

Overall, these results confirmed that practice size made a difference in the interoperability components, with smaller practices reporting less capability to send, receive, and query patient information. This study confirmed that most practices are using 2015 certified EHRs and yet still face challenges with interoperable data exchange. Respondent comments indicated organizations struggle with having enough resources – both funding and staffing expertise, to make progress.

Beyond the interoperability components, the survey examined how practices are using the information from their EHR to impact patient care. Organizations reported their practices analyze and use patient information from the EHR to perform a variety of activities to improve quality and/or efficiency of care. Most practices (85%) engage in data analytics, for example, to monitor care or enhance quality of care, population health, or operational efficiency. Many practices (83%) used EHR data to coordinate patient care to improve population health (Figure 4).

Practices reported they already completed implementing a variety of technology for information sharing and providing patients with access to health information. A total of 82% of practices have a patient portal, 75% have telehealth capabilities, and 73% have patient APIs (Figure 6).

Among organizations that did not already complete implementation of the types of technology mentioned in the survey, the four highest priorities were to increase use of: 1) Direct Secure Messaging, 2) quality reporting APIs, 3) telehealth, and 4) integrating SDOH information into the EHR (Figure 7).

Many of the practices indicated that APIs for reporting quality or performance data (e.g., to Medicare, Medicaid, or other payers) are a priority, but only 21% of providers said they completed APIs for reporting. This study found 82% of practices already had patient portals and have implemented patient APIs (73%). Twenty-one percent of practices can integrate data from patient wearable devices.

Finally, the types of entities most frequently identified as priorities for future data sharing, were: 1) community-based organizations, 2) payers, and 3) nursing homes (Figure 8).

Discussion

The results of this study provide valuable insight into the current Iowa HIT landscape of provider practice and clinics who participated in the Promoting Interoperability Program. Even though nearly all of the practices that responded use 2015 certified EHRs, and presumably have the capability to send and receive patient information interoperably, many are not yet optimizing their EHRs for use or participation in interoperable data exchange. While practices frequently reported using data exchange capabilities within their EHR vendor systems, use of proprietary EHR vendor-based HIE raises questions about whether all parties will be willing to expend additional effort to share data with providers using different EHR vendors. More work is needed to exchange information among disparate EHR systems – such as through interstate health information exchange networks (HIN/HIOs).

This study documented large discrepancies between capabilities for large and small practices. Although nearly all large practices surveyed were able to send, receive, query, and integrate data from outside their organization – only a fraction of the smaller practices had achieved interoperability. Some of these practices did not necessarily intend to become completely interoperable since they were not required by CMS to do so (e.g., specialist providers), some explained there were some privacy concerns (e.g., HIV, mental health, and behavioral health providers), and others commented that financial grants would be helpful in achieving interoperability (e.g., purchasing tools and additional features).

Although practices have been able to integrate at least some types of essential patient information from providers outside their organizations there are notable disparities in data integration between smaller and larger practices. Furthermore, to achieve interoperability, more types of information are needed to provide a full picture of patient health. Future efforts should include integration of additional data types – some of which were reported as currently integrated by fewer than 50% of practices: radiology/PACS, SDOH from community-based organizations, and patient wearables.

The CMS Promoting Interoperability Programs were only for eligible professionals (EPs) and eligible hospitals (EHs). Many types of health care providers were not eligible for assistance[8] – and as a result, provider practices are still working to achieve interoperable information exchange with nursing facilities, labs, and SDOH community-based providers. SDOH data from community-based organizations has been identified by ONC as a priority to eliminate health disparities and improve population health.[9] The U.S. Core Data for Interoperability (USCDI) V2 recently released a new data class, including the data elements for coding SDOH data[10], which should help practices improve data exchange.

Despite progress, there are still providers using fax to exchange data. Respondent comments indicated this is sometimes due to practices working with providers that don't have interoperable exchange capabilities. The ONC published a "Strategy on Reducing Regulatory and Administrative Burden Relating to the Use of Health IT and EHRs"[11] which reiterates the need to reduce burden for providers by promoting common standards for Health IT systems that support interoperability.

Finally, a surprising number of practices reported using their EHR for data analytics and population health activities. These are advanced capabilities needed for value-based care and clinical quality improvement, indicating that organizations are working to balance compliance with Meaningful Use and interoperability with urgent need for analytics. This suggests that providers are working on a wide variety of HIT initiatives. Great progress has been made due to the Promoting Interoperability Programs, and organizations indicate that there are still many priorities to meaningfully use HIT and fully realize value of these investments.

---

[8] https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms
[9] https://www.healthit.gov/topic/health-it-health-care-settings/social-determinants-health
[10] https://www.healthit.gov/isa/uscdi-data-class/social-determinants-health#level-2
[11] ONC." Strategy on Reducing Regulatory and Administrative Burden Relating to the Use of Health IT and EHRs." February 2020. Downloaded from: https://www.healthit.gov/topic/usability-and-provider-burden/strategy-reducing-burden-relating-use-health-it-and-ehrs

Appendix A. List of Acronyms and Abbreviations

Acronym	Definition
ADT	Admission, discharge or transfer
API	Application programming interface
ARRA	American Recovery & Reinvestment Act of 2009
CERT	Certified electronic health record technology
CMS	Centers for Medicare & Medicaid Services
EH	Eligible hospital
EHR	Electronic health records
EP	Eligible professionals
HIE	Health information exchange
HIN	Health information network
HIO	Health information organization
HIT	Health information technology
HITECH	Health Information Technology for Economic Clinical Health
IDPH	Iowa Department of Public Health
IDSS	Iowa Disease Surveillance System
IHIN	Iowa Health Information Network
IME	Iowa Medicaid Enterprise
IRIS	Immunization Registry Information System
ONC	Office of the National Coordinator for HIT
PACS	Picture archiving and communication system
POC	Point of contact
SDOH	Social determinants of health
VA/DOD	Veteran's Affairs or Department of Defense